AD NUMBER

AD889235

NEW LIMITATION CHANGE

TO

Approved for public release, distribution unlimited

FROM

Distribution authorized to U.S. Gov't. agencies only; Proprietory info.; 23 Nov 1971. Other requests shall be referred to Army Biological Defense Research center, Ft. Detrick, MD 217801.

AUTHORITY

SMUFD, D/A ltr, 18 Feb 1972

TRANSLATION NO. 2747

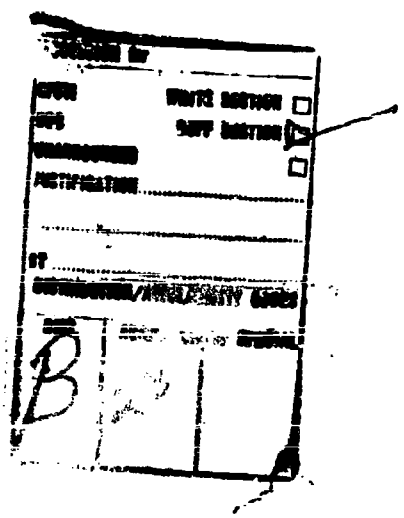
DATE: NOV 1970

CB

DISTRIBUTION STATEMENT

Distribution limited to U. S. Government agencies only; proprietory information; statement applied 23 NOV 1971. Other requests for this document must be referred to: Commanding Officer, U. S. Army Biological Defense Research Center, ATTN: Technical Information Division, Fort Detrick, Frederick, Maryland 21701.

DEPARTMENT OF THE ARMY
Fort Detrick
Frederick, Maryland 21701


WHITE SECTION
BUFF SECTION
NOTIFICATION
B

STUDY OF AN OUTBREAK OF VENEZUELAN ENCEPHALITIS [illegible]

[Article by Drs Armando Soto Escalona and Slavia [illegible] of Clinical Research, University of Zulia), and Dr Luis T. [illegible] Health Service, Maracaibo); Investigacion Clinica, Spanish, [illegible] 45-57]

Introduction

Venezuelan encephalitis has appeared in epidemic [illegible] in the Venezuelan portion of the Guajira, State of Zulia, since [illegible] July 1930 [5], and has existed in epidemic form for a period now [illegible], although there are suspicions that it has been confused with other [illegible] diseases [1]. By 1962 the virus had been isolated from patients in the [illegible] epidemic which attacked the Guajira and extended to the eastern end of the country [2, 6]. In October 1968 the region experienced a new outbreak, which is analyzed in the present article.

Description of the Epidemic

The affected region. The State of Zulia occupies the northwest part of Venezuela, between 71 and 73 degrees west longitude [illegible] degrees north latitude. The Paez District lies in the northernmost part of the state and borders north and west on the Republic of Colombia, [illegible] District of the same state, and east on the Gulf of Venezuela. It has an area of 3,140 square kilometers, and includes two municipalities: [illegible]. In terms of vegetation three zones are distinguished in the District: a forest zone, a pre-desert zone, and a desert zone. The two latter zones were the ones most seriously affected by the epidemic; here the temperature is 29 degrees Centigrade in the shade with an annual rainfall less than 500 millimeters (Figure 1). The population estimate for 1968 was [illegible], with an average density of 8 inhabitants per square kilometer. In addition to the populated centers there are numerous widely spaced ranches.

Development of the epidemic. The situation was seen to be abnormal when a significant increase occurred in the number of febrile [illegible] appearing at the Rural Medical Station in Paraguaipoa, capital of the municipality of Guajira. An investigation performed around the village uncovered a large number

of diseased horses and a certain number of dead [illegible]. Experience in previous epidemics helped in forming a provisional [illegible] Venezuelan encephalitis, which was later confirmed by isolation [illegible] from the blood of several patients.

Isolation and identification of the virus. [illegible] based on serum from the acute phase of febrile patients, by intracerebral inoculation of newborn Swiss white mice and in cultivated cells of [illegible] (HeLa). Fourteen viruses were isolated from 14 inoculated [illegible]. Identification was made in two of the mouse samples, using the following [illegible] mouse protection. The problem sample was divided in two, one [illegible] equal parts with serum which was immune to the virus of Venezuelan equine encephalitis (VEE) (immune horse serum, Lot 1, National Communicable [illegible], Atlanta, Georgia); the other part was mixed with a phosphate buffer [illegible] of 7.4. Both mixtures were incubated at 37 degrees Centigrade for one hour and then inoculated intracerebrally into newborn Swiss white mice. [illegible] animals inoculated with the problem serum which had not been treated with [illegible] died 20 hours after inoculation. The mice protected with immune serum [illegible] observed for one week and showed no signs of disease whatever.

Serological studies. Twenty pairs of serum, [illegible] convalescent, were studied using Clarke and Casals hemagglutination inhibition test [2] modified by Sever as a microtechnique [7] and employing kaolin to eliminate the non-specific inhibitors. In 18 cases there was a clear increase in the titre of antibodies to the VEE virus (Table 1).

Criteria for classifying the evidence. Using the criteria employed in 1962 [1], four groups were considered. Group 1 included all those patients who showed three or more of the following symptoms: fever, chills, intense headaches, sclero-conjunctival congestion, facial [illegible], pharyngo-amygdalitis, cervical adenopathies, nausea, diarrhea, and vomiting. Group 2 was made up of patients with some of the foregoing symptoms and [illegible] manifestations such as nystagmus, meningeal symptoms, somnolency, [illegible], and delirium. Group 3 consisted of doubtful cases, very [illegible] indistinguishable from any other febrile condition. These patients were not included in the case studies. Group 4 contained all patients with clearly defined illnesses different from Venezuelan encephalitis.

Distribution throughout time. Figures 2 and 3 show the number of patients consulting the medical stations in Paraguaipoa and Maracaibo daily beginning on 1 October 1968. A sudden increase can be observed beginning on 27 October and lasting until 1 November. The number of patients at the medical stations began to decline on the day control measures were begun. The epidemic curve for each municipality does not differ from the overall curve for the entire district (Figure 4).

Rate of attack. Table II shows the population of the Perijá District estimated as of 1 July 1968 and the rate of attack of the disease per 1,000 inhabitants. The villages most seriously affected were Paraguaipoa, La Punta, Los Filudos, Mariche, and El Cañito, located in a relatively small area shown

in Figure 5. A total of 1,077 syndromes c... ...zuelan encephalitis were registered. Of these, 150 showed cli... ...nervous system. Only two deaths were attributable to the di... ...ildren under one year of age.

Table III shows the distribution of ... . The highest incidence of the disease is observed ... ...rs of age, a fact which can be seen more clearly in ... ...mortality rates in population groups above and below 5 ye... ...difference is extremely significant. Among older people th... ...progressively smaller. Table V shows the distribution of ... ...sex. In the extreme ages, below one year and above 40, t... ...collection for females. The other age groups show no sign... ...ased on sex.

Discussion

The disease has been known in epi... ...guira since 1936 [4], although Callo and Vogelsang [2] a... ...d in the area in 1930. Encephalitis among humans, howev... ...ows that early, possibly because of confusion with other fe... ...ording to observations by Avilan [1] the malaria epidem... ...the region in 1910, 1915, 1916, 1920, 1926-27, 1931, 1... ...could have been epidemics of Venezuelan encephalitis. ...-50 and 1959, the outbreaks diagnosed as influenza could also ... ...lan encephalitis when it is noted that there were also case... ...burros [1]. It was not until 1962 that the presence of ... ...ubtilis virus was confirmed in patients during an epidemic wh... ...region [6].

The fact that the mortality rate is h... ...children under 6 years of age indicates that the virus has not b... ...population since the epidemic of 1962. This agrees with ... (to be published) on the absence of antibodies against Venezu... ...is among children under 5 years of age in the Guajira in 1... ...ble history of the disease in the area, it can be concluded th... ...a cyclic activity and that there are no cases of the disease i... ...between epidemics.

Some authors [3, 6] have reported th... ...ressive disappearance of a certain type of antibodies in ... ...suffered Venezuelan encephalitis. But the epidemiological ... ...that this apparent loss does not modify the acquired resistance ... . It is observed that mortality rates are progressively lower ... ...higher ages, and this, in a population uniformly exposed to the ca... ..., is a demonstration of immunity. Furthermore, one can observe ... ...nfection in children under one year old, which can be explained ... ...smitted maternal antibodies. It can be concluded from the fore... ...that the disease confers long-lasting immunity.

In addition to the 1,077 cases exam... ..., there were around 500 consulting patients with febrile conditions which were not diagnosed as Venezuelan encephalitis because they did not meet the established criteria but

who probably had very benign cases of the d[illegible] to Ryder (in publication) it is also probable that [illegible] infections caused by this virus, since high titres of antibodies [illegible] were found in zones where no epidemics of Venezuelan encephalitis [illegible] described, such as the region to the south of Lake Maracaibo. [illegible] of the disease must have been much greater than the [illegible].

The serious neurological cases represented [illegible] of the total of patients, a high percentage in comparison [illegible] which the level was calculated at 6%. If we include among [illegible] consulting patients placed above in group 3, we arrive at [illegible] neurological cases, a number which is in any case higher [illegible]. The number of deaths attributable to the disease was 0.1%, [illegible] much lower than the figure for the previous epidemic [3].

No logical explanation was found for the [illegible] preponderance for females among children less than one year old and [illegible] over 40. It should be noted that the difference was observed only [illegible].

Summary

An epidemic of Venezuelan encephalitis [illegible] in October 1968 in the District of Paez, State of Zulia, [illegible]. A total of 1,077 cases of the disease were registered, [illegible] included evident attack on the nervous system. Two deaths were [illegible] to the encephalitis, both in children less than one year old. [illegible] number of cases among children less than 6 years old; this [illegible] was the last encephalitis epidemic in the region, which points to [illegible] ity of the virus. It was concluded that the virus is inactive [illegible] epidemic periods. The immunity conferred by the virus is apparently [illegible], as indicated by the small number of older patients and [illegible] than one year old, the latter protected by transmitted material [illegible].

BIBLIOGRAPHY

1. Avilan, J.M., "The outbreak of Ve... in the north of the State of Zulia at the end of ... Asist. Soc. (Review of Venezuelan Sanitation ... 2), 231-321, 1964.

2. Clarke, D. H. and Casals, J., "Tech... and hemagglutination-inhibition with arthropod-b... Trop. Med. Hyg., Vol. 7, 561-573, 1962.

3. Groot, H., "Studies of arthropod-bor... ," Rev. Acad. Colomb. Cienc. exactas Nat. (Review of ... of Exact Natural Sciences), Vol. 12, 197-[illegible].

4. Kubes, V., "Venezuelan-type equine ... Trinidad," Science, Vol. 99, 41-42, 1944.

5. Quiroz, C., "History of equine encephalo... Venezuela", Rev. Ven. Sanidad, Asist. Soc., Vol. 31, 831-839, 1[illegible].

6. Sellers, R. F., Bergold, G. H., Sa... Casals, A., "Investigations during Venezuelan equine encep... in Venezuela 1962-1964," Am. J. Trop. Med. Hyg., Vol. [illegible].

7. Sever, J. L., "Application of a microtec... serological investigation," J. Immunol., Vol. 88, 320-32[illegible].

Figura N° 1. Mapa del Distrito Páez en el cual se indican los pueblos y caseríos afectados por el brote.

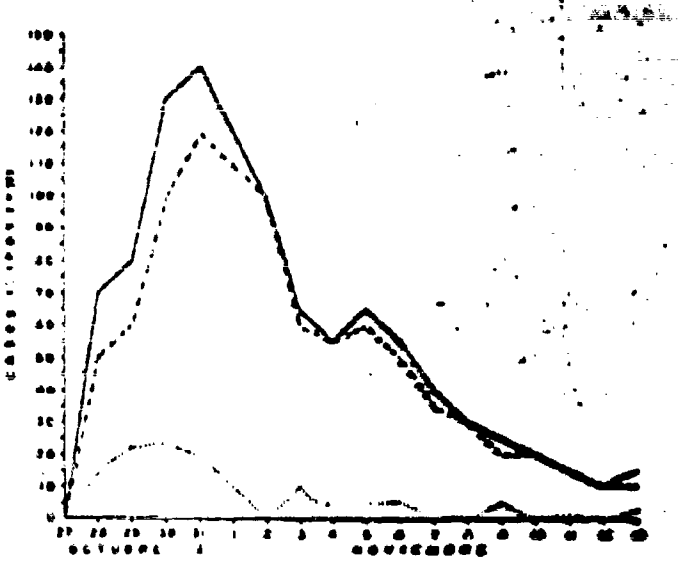


Figura N° 4. Curva epidémica para todo el Distrito y para ambos Municipios. La epidemia se produjo principalmente a expensas del Municipio Guajira. El Municipio Simultaneamente contribuyó poco a la forma de la curva. (Paraguaipoa ..... Simultaneo ..... Distrito Páez ——).

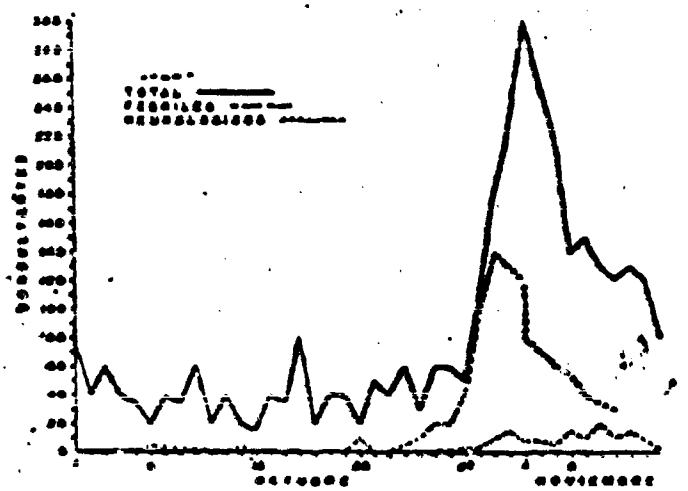


Figura N° 2. Número de consultantes a la Medicatura Rural de Paraguaipoa desde el 1° de Octubre de 1968. Se observa la epidemia del brote el 23 del mismo mes.

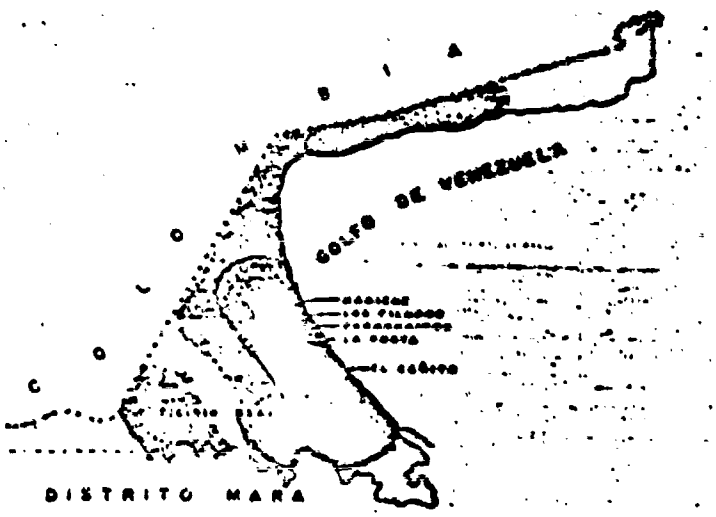


Figura N° 5. Mapa del Distrito en el cual se indican las zonas aproximadamente afectadas. En la zona en negro se registraron más de 600 casos. Los caseríos ubicados en la zona gris registraron entre 200 y 600 casos. El resto de los 1.077 casos se consignaron en la zona considerada.

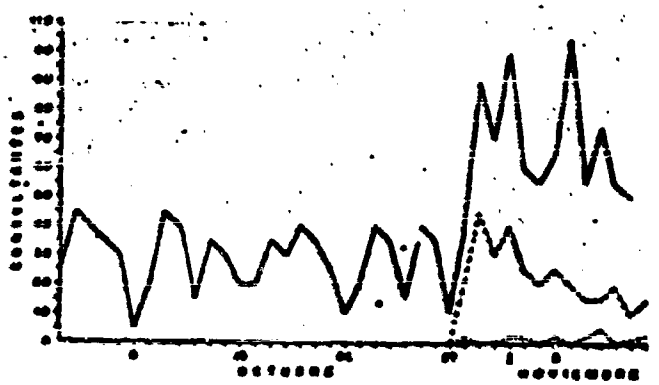


Figura N° 3. Número de consultantes de la Medicatura Rural de Simultaneo durante el mismo lapso de tiempo. Aunque se observa un aumento evidente de los casos febriles y consultantes, la curva es más irregular y de menor cuantía. (Febriles ---; consultantes ..... Total ——).

FIGURE CAPTIONS

Figure 1. Map of the District of [illegible], including villages and settlements affected by the outbreak.

Figure 2. Number of consultants to [illegible] location of Paraguaipoa beginning on 1 October 1988. The [illegible] outbreak on 27 October is visible.

Figure 3. Number of consultants at the [illegible] Station of Sinamaica during the same period. Although [illegible] in the number of febrile and convulsive cases can be seen, [illegible] lower and lower. (Febrile: -.-.-., neurological ----, total ——————.

Figure 4. Epidemic curve for the [illegible] for both municipalities. The epidemic affected primarily [illegible] of October. The Municipality of Sinamaica contributed [illegible] the curve. (Paraguaipoa -----, Sinamaica ....., Para Diarrea [illegible].

Figure 5. Map of the District, showing [illegible] affected regions. The region in black registered [illegible]. The villages in the gray region reported between 200 and 300 [illegible] of the 1,077 cases were found in the checked region.

Spanish Words Used in Figures

total	total
febril	febrile
neurologicos	neurological
consultantes	consultants
Octubre	October
Noviembre	November
Casos	cases
Tipos I y III	Types I and III

TABLES 1 THRU 5

TABLA I

(1) TITULOS DE ANTICUERPOS INHIBIDORES DE LA HEMAGLUTINACION CONTRA EL VIRUS EEV EN 20 PACIENTES.

(2) NOMBRE	(3) EDAD	(4) SUERO AGUDO	(5) SUERO CONVALECIENTE
L.G.A.	19	<10	80
N.M.	50	<10	>1280
N. Ch.	14	<10	320
E.Ch.	50	<10	160
E.Ch.	38	<10	160
J.A.	26	<10	< 10
A.V.	26	<10	160
R.P.	10	<10	160
V.M.	6	<10	160
M.P.	24	<10	320
N.C.	17	<10	160
M.G.	29	<10	>1280
J.R.	11	<10	320
I.G.	10	<10	320
F.P.	20	<10	>1280
J.G.	25	<10	320
C.C.	13	<10	320
M.M.	38	<10	< 10
V.G.	5	80	320
S.S.	–	40	320

TABLA II

(1) ENCEFALITIS EQUINA VENEZOLANA. DISTRITO PAEZ, ESTADO ZULIA. 1968. RELACION DE CASOS POR MUNICIPIOS. TASAS DE ATAQUE POR 1.000 HABITANTES

(2) MUNICIPIO	(3) POBLACION ESTIMADA*	(4) NUMERO DE CASOS	(5) CASOS POR 1.000
Guajira	13.937	957	68,7
Sinamaica	4.459	120	26,9
Distrito Páez	18.396	1.077	58,4

* Para el 1º de julio de 1968.

(6)

TABLA III

(1)

(2)

(9)
(10)
(11)
(12)
(13)

TABLA IV

1

2

9
10

TABLA V

1

2

9
10
11
12
13

8

TABLES

Table I

1. Titres of antibodies inhibiting haemagglutination against the VEE virus in 20 patients
2. Name
3. Age
4. Acute serum
5. Convalescent serum

Table II

1. Venezuelan equine encephalitis, Paez District, State of Zulia, 1968. Numbers of cases by municipalities and rates of attack per 1,000 inhabitants
2. Municipality
3. Estimated population
4. Number of cases
5. Cases per 1,000 inhabitants
6. As of 1 July 1968

Table III

1. Distribution of cases by age groups. Rates of attack per 1,000 inhabitants
2. Age groups
3. Guajira Municipality
4. Sinamaica Municipality
5. Paez District
6. Cases
7. Estimated population
8. Rate
9. Up to one year old
10. One to 6 years old
11. Forty and older
12. Age unknown
13. Total

Table IV

1. Differences in mortality rates between those above and below 6 years of age
2. Age groups
3. Guajira Municipality
4. Sinamaica Municipality
5. Paez District
6. Cases
7. Estimated population
8. Rate
9. Less than 6 years old
10. Over 6 years old

Table V

1. Distribution of cases by age groups [illegible] of attack per 1,000 inhabitants
2. Age groups
3. Guajira Municipality
4. Sinamaica Municipality
5. Paez District
6. Cases
7. Estimated population
8. Rate
9. Up to one year old
10. One to 6 years old
11. Forty and older
12. Age unknown
13. Total

V Male
M Female

2641
CSO: T-798-W